Reaserch Facilities Shared
Reaserch Facilities Info
Pan Gu
Xuan Wu
coorperation vision
Application Process

Reaserch Facilities Info

1.Containment Mockup for Performance Test

The Chinese name of experimental platform is "Xuanwu". It is supported by China National Key R&D Program, and CNNC R&D Fund on AHPR1000（HUALONG-2）. This platform includes a containment mockup, a temperature and pressure coupling loading system, and an intelligent monitoring system. The design of the containment mockup is based on HPR1000（HUALONG-1）, with a scale ratio of 1:3.2. It’ s height and diameter are about 25m and 15m, respectively. The volume is about 3500 m3. It is currently the largest prestressed reinforced concrete containment mockup in the world.It includes control system, boiler system, air compressor system. It can achieve severe accident loading conditions with a maximum pressure of 1.6 MPa and a maximum temperature of 160 ° C. A drainage system, a spray system, and a pressure relief system are also installed to ensure safety after overpressure in the containment.It includes 23 types of sensors, including displacement, strain, and prestress sensors, etc., with over 1400 measuring points. It can achieve real-time monitoring of structural response during the test, early warning and alarm, and containment health status evaluation.It can be used to conduct the research on containment performance and capacity under severe accident with temperature and pressure, intelligent technology for containment monitoring, and containment aging management.

2.The Platform for Integral Thermal-Hydraulic Behavior of Containment

The Platform for Integral Thermal-Hydraulic Behaviour of Containment (PANGU), is the first test bench at the Langfang R&D base of CNPE, with the symbolic meaning of creating a new world. Pangu has high-precision measurement capabilities and can be directly used to study the thermal-hydraulic behavior of large spaces in containment, the diffusion and transport characteristics of gases in complex compartments, and the coupling characteristics between various accident mitigation measures and large space thermal-hydraulic behavior. It can also provide a verification platform for containment thermal analysis software.This platform mainly includes a containment simulation body, a steam-gas supply system, a containment heat removal system, a spray system, a filtration and emission system, and a measurement and data acquisition system. The containment simulation body is an all steel pressure vessel with a total volume of 1010 m3, which adopts a reduction ratio of 1/3.8 in the height direction and 1/5.5 in the radial direction; The steam- gas supply system includes two gas boilers, one electric boiler, an air compressor, and a helium gas supply device, which can provide the required high-temperature and high-pressure steam, air, and helium. The containment heat removal system consists of five heat exchangers, a heat exchange water tank, a steam water separator, and auxiliary pipelines, which can be used to study the system characteristics at different heights and operating modes. The spray system consists of sprinkler ring pipes, nozzles, and sprinkler water tanks, which can be used to study the effects of sprinkler on large space thermal stratification and concentration stratification under different temperatures and operating modes; The filtration and emission system consists of a series of resistance components and a limiting orifice plate, which can be used to study the resistance characteristics and pressure relief capabilities of filters at all levels of the filtration and emission system; The measurement and data acquisition system consists of a Doppler laser velocimeter, a high-precision anemometer, a thermal conductivity meter, a mass spectrometer, and a large number of thermocouples, which can accurately and real-time monitor and collect changes in thermal parameters inside the containment.

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